Chemical/Biological Terrorism
May, 2003

1: AIHA J (Fairfax, Va). 2003 Jan-Feb;64(1):95-101.
A risk analysis approach to selecting respiratory protection against airborne pathogens used for bioterrorism.
Nicas M, Hubbard A.
Center for Occupational and Environmental Health, School of Public Health, Room 140 Warren Hall, University of California, Berkeley, CA 94720-7360, USA.
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The authors present a quantitative risk analysis approach to estimating infection risk due to airborne pathogens exhibiting relatively large infectious dose values. The method is applied to hypothetical scenarios involving airborne spores of Bacillus anthracis. The method combines the estimated parameters for exposure intensity, the pathogen dose-response relationship, and respirator penetration values (if respiratory protection is used). Because knowledge of the true parameter values will be uncertain, an uncertainty analysis is an essential part of the process. Given a specified value for acceptable infection risk, the method permits choosing a respirator that sufficiently reduces exposure to meet the acceptable risk criterion. A strength of the risk analysis approach is its transparency, in that the model structure and data inputs are explicitly identified. Further, risk analysis informs the expert judgment that must typically be applied in selecting respiratory protection against airborne pathogens.
PMID: 12570401 [PubMed - indexed for MEDLINE]

2: Am Fam Physician. 2003 May 1;67(9):1877-8.
Importance of bioterrorism preparedness for family physicians.
Rippen HE, Gursky E, Stoto MA.
Publication Types: Comment Editorial
PMID: 12751652 [PubMed - in process]

3: Am Fam Physician. 2003 May 1;67(9):1927-34.
Recognition and management of bioterrorism infections.
O'Brien KK, Higdon ML, Halverson JJ.
Family Practice Residency Program, Martin Army Community Hospital, Fort Benning, Georgia, USA.

Recent events have demonstrated that bioterrorists have the ability to disseminate biologic agents in the United States and cause widespread social panic. Family physicians would play a key role in the initial recognition of a potential bioterrorism attack. Familiarity with the infectious agents of highest priority can expedite diagnosis and initial management, and lead to a successful public health response to

such an attack. High-priority infectious agents include anthrax, smallpox, plague, tularemia, botulism, and viral hemorrhagic fever. Anthrax and smallpox must be distinguished from such common infections as influenza and varicella. Anthrax treatment is stratified into postexposure prophylaxis and treatment of confirmed cutaneous, intestinal, or inhalation
anthrax. Disease prevention by vaccination and isolation of affected persons is key in preventing widespread smallpox infection. Many resources are available to physicians when a bioterrorism attack is suspected, including local public health agencies and the Centers for Disease Control and Prevention.
PMID: 12751654 [PubMed - in process]

4: Am J Infect Control. 2003 May;31(3):176-7.
The anthrax team: a novel teaching approach to increase anthrax and bioterrorism awareness.
Brooks KL, Dauenhauer SA.
Overton Brooks VA Medical Center.

A team approach to educating staff regarding anthrax and bioterrorism awareness was implemented after the acts of terrorism that began September 11, 2001. "The Anthrax Team" developed algorithms on the basis of 5 different scenarios, an educational brochure, and a PowerPoint presentation. With use of the algorithms and PowerPoint material, the team conducted informal educational sessions to increase awareness and allay fears. On the basis of the success of this educational method, the teaching process will be applied to address staff on other biologic and chemical terrorism agents.
PMID: 12734524 [PubMed - in process]

5: Am J Infect Control. 2003 May;31(3):129-34.
Infection control practitioners' perceptions and educational needs regarding bioterrorism: Results from a national needs assessment survey.
Shadel BN, Rebmann T, Clements B, Chen JJ, Evans RG.
Center for the Study of Bioterrorism and Emerging Infections, School of Public Health, Saint Louis University.

BACKGROUND: The perceived threat that biological weapons will be used in an act of terror against the United States has escalated sharply since the discovery of anthrax-tainted letters after the terrorist attacks of September 11, 2001. These events underscore the critical nature of health care and public health preparedness and the need to augment infection control practitioner education and training. METHODS: Between October 2000 and August 2001 a national needs assessment was conducted by use of a 35-question survey. The survey measured infection control practitioners' (ICPs') perception of the risk for bioterrorism in the United States and in their community, the proportion of ICPs with prior training in bioterrorism preparedness, and preferences for delivery media of future bioterrorism education. RESULTS: The assessment of the perceived threat of bioterrorism in the United States during the next 5 years (P =.022) and in the ICPs' work community (P <.001) revealed significant regional differences.
Only half (56%) of the respondents reported prior training in bioterrorism preparedness. Respondents reported that the 2 most common barriers to receiving training were lack of training opportunities (70.2%) or no dedicated work time for training (19.4%). CONCLUSIONS: The results of this study indicate an urgent need for more resources and opportunities for clinical education in bioterrorism preparedness that will provide continuing education credit. Successful bioterrorism

education will require a variety of instructional designs and media delivery methods to address ICPs' preferences and needs.
PMID: 12734517 [PubMed - in process]

6: Ann Emerg Med. 2003 Apr;41(4):441-6.
Medical counterbioterrorism: the response to provide anthrax prophylaxis to New York City US Postal Service employees.
Partridge R, Alexander J, Lawrence T, Suner S.
Office of Emergency Preparedness, Department of Health and Human Services, Rockville, MD, USA. Rpartridge@lifespan.org

STUDY OBJECTIVE: We describe and analyze a recent rapid deployment of disaster medical assistance teams and other government agencies to provide medical screening and anthrax prophylaxis to New York City US Postal Service employees potentially exposed to letters contaminated with anthrax spores. METHODS: A description of the response effort is presented. Data were collected on standardized forms and included the numbers of postal employees screened and offered antibiotic prophylaxis, as well as the numbers of patients seen per worker hour by various medical professionals. RESULTS: One hundred members of 5 disaster medical assistance teams and other health professionals were deployed to New York City within 18 hours of activation. Over a 68-hour period, 7,076 patients were evaluated, representing all postal employees in the 6 major postal facilities in New York believed to be at risk for anthrax exposure. Of the total, 2,452 patients were seen during the first 24 hours, 3,875 during the second 24 hours, and the remaining 749 during the last 20 hours of operations. An average of 161 employees were screened per hour. The antibiotic most commonly dispensed was ciprofloxacin, followed by doxycycline and amoxicillin. CONCLUSION: The deployment of disaster medical assistance teams and other agencies to New York City to provide prophylaxis against inhalation anthrax to US Postal Service employees provides lessons for a rapid, efficient, and effective response to acts of bioterrorism. This deployment might also serve as a scaleable model for future events requiring medical prophylaxis.
PMID: 12658240 [PubMed - indexed for MEDLINE]

7: Ann Emerg Med. 2003 Apr;41(4):447-52.
Syndromic analysis of computerized emergency department patients' chief complaints: an opportunity for bioterrorism and influenza surveillance.
Irvin CB, Nouhan PP, Rice K.
Department of Emergency Medicine, St. John Hospital and Medical Center, Detroit, MI, USA. cbi@123.net

STUDY OBJECTIVE: Emergency department computerized triage logs might be useful for automated ED surveillance and potentially for early identification of bioterrorism events. We describe a Web-based surveillance program and its feasibility for surveillance. METHODS: A Web-based surveillance program that receives computerized chief complaint data daily from a large academic urban teaching hospital and performs syndromic analysis on these data was developed. On the basis of preset limits, the Web-based surveillance program sends an alert e-mail message when the syndromic analysis reveals an increase in the number of patients in predefined symptom groups. The feasibility of this system was tested by using historical data during an influenza outbreak (December 1999 to January 2000) and applying the anthrax symptom group. RESULTS: The Web-based surveillance program identified the influenza outbreak in the first week.

CONCLUSION: Computerized triage logs might be a feasible method for bioterrorism and influenza surveillance. The Web-based nature of the surveillance program creates the opportunity for other hospitals to contribute data, potentially resulting in an automated network of ED computerized triage log surveillance.
Publication Types: Evaluation Studies
PMID: 12658241 [PubMed - indexed for MEDLINE]

8: Ann Emerg Med. 2003 Apr;41(4):453-6.
Atropine availability as an antidote for nerve agent casualties: validated rapid reformulation of high-concentration atropine from bulk powder.
Geller RJ, Lopez GP, Cutler S, Lin D, Bachman GF, Gorman SE.
Department of Pediatrics, Emory University School of Medicine, Atlanta, GA 30303, USA.

STUDY OBJECTIVE: Atropine is the preferred antidote for immediate management of toxicity associated with nerve agents or other cholinergic syndromes. A large-scale exposure to a nerve agent or organophosphate insecticide might result in many victims presenting for care within a short period of time. This situation would require the prompt availability of a large amount of atropine to provide treatment. Antidote stocks at many hospitals are inadequate to meet this demand. Atropine that is commercially available comes supplied at concentrations of either 0.4 mg/mL or 1 mg/mL, thereby requiring intravenous administration because of the volume necessary to administer the commonly recommended initial dose of 2 to 6 mg. Moderately ill victims may not require an intravenous line for other care, and in the setting of overwhelmed resources, intramuscular administration is faster and easier to perform. METHODS: To facilitate the
delivery of larger atropine doses, we developed a method of fortifying existing injectable atropine with bulk pharmaceutical-grade atropine powder to a concentration of 2 mg/mL, thereby increasing the amount available and facilitating its intramuscular administration. An independent analysis of the resulting formulation was undertaken to assess its potency, absence of pyrogens, and stability. RESULTS: The amount of atropine initially present varied by less than +/-5%, within the range allowed by the US Pharmacopeia for the original product. The product was pyrogen free and maintained its potency at refrigeration temperature for at least 8 weeks after preparation and at room temperature for 4 weeks. Once all materials were available, the compounding of
this preparation required about 1 hour to complete. CONCLUSION: Existing atropine stocks can be readily augmented by fortification with powdered atropine accurately and inexpensively. Common pharmaceutical guidelines recommend refrigeration for compounded products such as this if not completely used within 28 days.
PMID: 12658242 [PubMed - indexed for MEDLINE]

9: Ann Health Law. 2003;12(1):75-120, table of contents.
Bioterrorism meets privacy: an analysis of the Model State Emergency Health Powers Act and the HIPAA privacy rule.
Bruce J.

Ms. Bruce's paper analyzes the interplay between the Model State Emergency Health Powers Act and the HIPAA Privacy Rule. The article begins by examining specific relevant provisions of the Act and Rule. Next, it traces the history of public health law through the court system and then uses this foundation to discuss how the Model State Emergency Health Powers Act and the HIPAA Privacy Rule could co-exist, protecting Americans in the case of a bioterror attack, while being appropriately sensitive to the confidentiality of private health information.

Publication Types: Legal Cases
PMID: 12705205 [PubMed - indexed for MEDLINE]

10: Ann Pharmacother. 2003 Jan;37(1):132-5.
Bioterrorism web sites for pharmacists.
Misita CP, Boosinger AB, Kendrach MG.
McWhorter School of Pharmacy, Samford University, Birmingham, A 35229-7027, USAL.

OBJECTIVE: To identify Internet Web sites for ease of accessibility to bioterrorism-related information, comprehensive provision of bioterrorism-related information, and provision of bioterrorism information that specifically pertains to the pharmacy profession. DATA SOURCES: Web sites of national pharmacy organizations, US government agencies, and medical organizations, as well as Web sites related to bioterrorism. DATA SYNTHESIS: Pharmacists need access to relevant bioterrorism information in a timely manner. An evaluation of Web sites was performed to identify those that include a discussion of the potential infectious microorganisms and prevention and treatment methods, as well as unique features for pharmacy practice. RESULTS: The American Society of Health-System Pharmacists and American Pharmaceutical Association Web sites provide pharmacy-specific recommendations. The Centers for Disease Control and Prevention provides biological agent information and health department contact numbers. Additional agent-specific data are provided by the American Medical Association, The Johns Hopkins University, and the Food and Drug Administration (FDA) Web sites. Information addressing food safety is provided by the FDA. CONCLUSIONS: Pharmacy-specific bioterrorism information is available only at selected national pharmacy organization Internet Web sites. However, other Web sites provide comprehensive bioterrorism information useful for pharmacists.
PMID: 12503948 [PubMed - indexed for MEDLINE]

11: Arch Neurol. 2003 Apr;60(4):489-94.
Smallpox, bioterrorism, and the neurologist.
Cleri DJ, Villota FJ, Porwancher RB.
Internal Medicine Residency Program, St Francis Medical Center, Trenton, NJ 08629, USA.
Publication Types: Review Review, Tutorial
PMID: 12707060 [PubMed - indexed for MEDLINE]

12: Arch Ophthalmol. 2003 May;121(5):715-9.
Comment in: Arch Ophthalmol. 2003 May;121(5):710-1.
The ocular complications of smallpox and smallpox immunization.
Semba RD.
Wilmer Eye Institute, The Johns Hopkins University School of Medicine, Baltimore, MD 21205, USA. rdsemba@jhmi.edu

Although smallpox was eradicated worldwide, concerns have been raised about the use of smallpox as a biological weapon. Plans are being considered for smallpox immunization in the United States. Variola virus, the cause of smallpox, and vaccinia virus, used in smallpox immunization, are both orthopoxviruses that are associated with serious ocular complications, including eyelid and conjunctival infection, corneal ulceration, disciform keratitis, iritis, optic neuritis, and blindness. About 5% to 9% of patients with smallpox develop ocular complications, and case-fatality rates reach

20% to 35% among unvaccinated individuals. About 10 to 20 patients develop ocular complications per 1 million smallpox immunizations, usually through autoinoculation, in which the patient transfers vaccinia from the immunization site to the eye. The risk of ocular vaccinia infection may be reduced by instructing patients and individuals in
close contact with the vaccinee to wash their hands often and avoid touching the immunization site and their eyes. Topical antiviral therapy, topical steroids, and topical and oral antibiotics have been used to reduce the ocular complications of smallpox immunization. In contrast, there has been little experience with the use of these therapies for the ocular complications of smallpox.
Publication Types: Review Review, Tutorial
PMID: 12742852 [PubMed - indexed for MEDLINE]

13: Arch Ophthalmol. 2003 May;121(5):710-1.
Comment on: Arch Ophthalmol. 2003 May;121(5):715-9.
National preparedness for biological warfare and bioterrorism: smallpox and the ophthalmologist.
Maki DG.
Publication Types: Comment Editorial
PMID: 12742850 [PubMed - indexed for MEDLINE]

14: Biol Res Nurs. 2003 Apr;4(4):251-4.
Comment on: Biol Res Nurs. 2003 Apr;4(4):244-50.
Commentary on "New challenges for public health care: biological and chemical weapons awareness, surveillance, and response".
Schoch-Spana M.
111 Market Place, Suite 830, Baltimore, MD 21202. mschoch@jhsph.edu
Publication Types: Comment
PMID: 12712973 [PubMed - indexed for MEDLINE]

15: Biol Res Nurs. 2003 Apr;4(4):244-50.
Comment in: Biol Res Nurs. 2003 Apr;4(4):251-4.
Biol Res Nurs. 2003 Apr;4(4):255-7.
New challenges for public health care: biological and chemical weapons awareness, surveillance, and response.
Dudley JP.
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Recent events in the United States have demonstrated a critical need for recognizing nurses and emergency health care providers as important elements of the nation's first line of defense and response against terrorist attacks involving biological, chemical, or radiological weapons. The anthrax letter attacks of September/October 2001 demonstrate the importance of vigilance and attention to detail while interviewing and attending patients and when entering, reviewing, and cataloging patient records. Nursing professionals, emergency care responders, and physicians can perform a crucial role in our first-line defense against terrorism by detecting and reporting unusual or anomalous illness(es) consistent with possible exposure to biological or chemical agents. Nursing
professionals should become more familiar with the etiology and clinical symptoms of biological agents of greatest current concern (smallpox, anthrax, tularemia, plague) and be alert for potentially anomalous or unfamiliar combinations of symptoms that

could point to unwitting exposure to biological toxins, toxic chemicals, or cryptic radiological agents. Public health surveillance systems must be developed that encourage and facilitate the rapid reporting and follow-up investigation of suspect illnesses and potential disease outbreaks that will ensure early identification and response for covert attacks involving biological, chemical, or radiological weapons.
PMID: 12698916 [PubMed - indexed for MEDLINE]

16: Biol Res Nurs. 2003 Apr;4(4):306-10.
Increasing nursing research opportunities in biodefense: National Institute of Nursing Research Science workgroup.
Sigmon HD, Larson EL.
Office of Extramural Programs, National Institute of Nursing Research, 6701 Democracy Boulevard, Room 710, One Democracy Plaza, Bethesda, MD 20892-4870, USA. hilary_sigmon@nih.gov

The threat of bioterrorism and the need for biodefense are new challenges for the scientific community. Bioterrorism already has had significant effects on the nation's health. Researchers involved in nursing research are addressing these effects and the many issues relevant to biodefense. To explore the role and potential contributions of nursing research in these arenas, the National Institute of Nursing Research (NINR) recently convened a science workgroup. The workgroup highlighted current knowledge in biodefense, suggested opportunities for nursing research, and proposed specific research topics and research training needs. The topics are integral to the strategic plan on biodefense developed by the National Institutes of Health and include biologic, behavioral, applied/translational, and health systems research. Nurse researchers can
contribute particularly to biologic studies directed toward effective diagnosis, treatment, and prevention of the effects of bioterrorism and biodefense.
PMID: 12698923 [PubMed - indexed for MEDLINE]

17: Biol Res Nurs. 2003 Apr;4(4):241-3.
Biological threats to America's health.
Talbot LA.

Nurses are critical in the public health role of conducting disease surveillance and contact tracing, administering vaccines or prophylactic medications, implementing restrictive measures, and collecting specimens for analysis. Currently, a window of opportunity exists where nursing can set forth a framework for action. Limited research presently exists in this new area of biodefense, and nurses can make a difference. This special issue of Biological Research for Nursing provides some insight and guidance into an area of study that is unfamiliar to many health care providers.
Publication Types: Editorial
PMID: 12698915 [PubMed - indexed for MEDLINE]

18: Biol Res Nurs. 2003 Apr;4(4):295-304.
Safeguarding our nation's children: the diagnosis, management, and containment of smallpox in infants and children.
Veenema TG.
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Smallpox continues to be a major national health concern as it poses the most serious bioterrorist threat to the US population at this time. Due to similarities in clinical presentation, smallpox may easily be confused with varicella (chickenpox) in young children. Management of a large-scale outbreak of smallpox in young children would require an intensive health care response. In addition, the current debate concerning potential revisions to the Centers for Disease Control and Prevention (CDC) interim guidelines for vaccination against smallpox has significant health implications for high-risk children and infants. As such, the diagnosis, management, and containment of smallpox in infants and children deserve special consideration.
Publication Types: Review Review, Tutorial
PMID: 12698922 [PubMed - indexed for MEDLINE]

19: Biol Res Nurs. 2003 Apr;4(4):282-94.
Smallpox: an update for nurses.
Constantin CM, Martinelli AM, Bonney EA, Strickland OL.
Emory University, Nell Hodgson Woodruff School of Nursing, Atlanta, Georgia, USA.

The global eradication of smallpox in the late 1970s was a major achievement of the 20th century and brought out the best in science and public health. Prior to eradication, smallpox was a devastating disease with an overall mortality rate of approximately 5% to 30% for the most common form of the disease depending on vaccination status and the clinical presentation. The more severe forms of smallpox (i.e., flat and hemorrhagic type) had case fatality rates of approximately 96% to 100%. Currently, there is heightened international concern regarding the potential use of the smallpox virus as an agent for bioterrorism. Therefore, it is imperative that health care workers become familiar with
clinical aspects of this disease as part of the national efforts to ensure homeland security. This article reviews the history, disease progression, and adverse events of smallpox; immunization practices; and nursing considerations.
Publication Types: Review Review, Tutorial
PMID: 12698921 [PubMed - indexed for MEDLINE]

20: Br J Biomed Sci. 2002;59(4):232-4.
Bioterrorism: an overview.
Clarke SC.
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Bioterrorism has reached the forefront of the public imagination following recent events across the world. The disaster of 11 September 2001, followed by anthrax letters sent via the US postal system and now renewed tension over Iraq have all brought the possibility of bioterrorism closer. A number of biological agents could be used in a terrorist attack, including anthrax, plague, smallpox and botulinum toxin. The serious diseases that these agents produce have been brought under control in the developed world; however, a lack of protective immunity against such diseases could cause considerable morbidity and mortality if used in a terrorist attack. This essay provides a background to bioterrorism, discusses many of the current points of interest and gives an update to the economic consequences of such an attack.
Publication Types: Review Review, Tutorial
PMID: 12572959 [PubMed - indexed for MEDLINE]

21: Clin Infect Dis. 2003 May 15;36(10):1275-83. Epub 2003 May 09.
Inhalational Anthrax Due to Bioterrorism: Would Current Centers for Disease Control and Prevention Guidelines Have Identified the 11 Patients with Inhalational Anthrax from October through November 2001?
Mayer TA, Morrison A, Bersoff-Matcha S, Druckenbrod G, Murphy C, Howell J, Hanfling D, Cates R, Pauze D, Earls J.
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A panel of 10 physicians used the nominal group technique to assess the ability of the Centers for Disease Control and Prevention (CDC) interim guidelines for clinical evaluation of persons with possible inhalational anthrax (IA) to retrospectively identify the 11 patients with IA seen during the October 2001 bioterrorism outbreak. The guidelines would not have identified 10 of 11 of these patients, primarily because the guidelines were designed to address only those patients with a known history of exposure or clearly identified environmental or occupational risk. The panel suggested revisions to the guidelines, primarily consisting of broadening the criteria for evaluation to include either known exposure or environmental occupational risk, or to include clinical symptoms consistent with IA. These extensions of the guidelines retrospectively identified 8 of 11 of the patients with IA from October 2001.
PMID: 12746773 [PubMed - in process]

22: Clin Infect Dis. 2003 Jun 1;36(11):1458-73. Epub 2003 May 22.
Bioterrorism web site resources for infectious disease clinicians and epidemiologists.
Ferguson NE, Steele L, Crawford CY, Huebner NL, Fonseka JC, Bonander JC, Kuehnert MJ.
Office of Health Communications, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, 30333, USA. nferguson@cdc.gov

Finding bioterrorism-related information on the World Wide Web can be laborious. We hope to help readers find such information more easily by summarizing essential information in a consistent framework. A panel of 7 Centers for Disease Control and Prevention reviewers identified Web sites and evaluated them for sponsorship, mission, content usefulness, online ease of use, and adherence to commonly accepted quality criteria. Of >100 potential sites identified, 81 were chosen for target content of interest, and 43 were selected for inclusion. The results were classified into general purpose/portal sites; biological agent information; laboratory, infection control, epidemiology, and mental health information; and emergency contact sources, news and updates, event preparedness resources, information for first-responder settings, clinical and public education materials, and research resources. Agents covered included anthrax, smallpox, plague, botulism, tularemia, and viral hemorrhagic fever.
PMID: 12766842 [PubMed - in process]

23: Clin Lab Sci. 2002 Winter;15(1):6-8.
Bioterrorism: What? Why? and Who?
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The former Secretary of the Department of Health and Human Services, Donna Shalala, indicated in an address in 1999 that complacency needs to be replaced with a sense of urgency in order for us to deal successfully with the threats of bioterrorism. The attack on September 11, 2001 and the anthrax threats have made our vulnerability clear. We are now living in a new and frightening world. Our complacency is gone. The victims and the survivors shall remain forever in our minds. Dr. Jeffery Koplan, Director, Centers for Disease Control and Prevention in his broadcast, Building Infrastruture to Protect the Public Health said we must look at preparedness in a new way. We need to: build a solid public health infrastructure with grant monies; rapidly address the problem of inadequately trained staff; and address the capacity of a laboratory to produce timely and accurate results for the diagnosis of agents in the investigation of outbreaks. We must take action to prepare the healthcare system to rapidly meet any challenge, overt or covert, that may emerge.
PMID: 12778948 [PubMed - in process]

24: Clin Lab Sci. 2002 Summer;15(3):177-9.
The Laboratory Response Network for bioterrorism.
Heatherley SS.
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OBJECTIVE: To describe the function and levels of analysis performed by members of the Laboratory Response Network in coping with biological agents of terrorism. DATA SOURCES: Current literature and the Internet. CONCLUSIONS: The Laboratory Response Network is designed to enable rapid, safe, and accurate diagnosis of disease in order to mobilize the nation's response to acts of bioterrorism.
PMID: 12778964 [PubMed - in process]

25: CMAJ. 2003 Apr 29;168(9):1172.
Much ballyhooed biohazard training yet to begin.
Kondro W.
Publication Types: News
PMID: 12719339 [PubMed - indexed for MEDLINE]

26: Conn Med. 2003 Feb;67(2):95-101.
Bioterrorism preparedness.
Jacobs LM, Burns K, Lane V, Ross J.
University of Connecticut School of Medicine, USA.

The Connecticut Department of Public Health (DPH) entered into a cooperative agreement with the Centers for Disease Control and Prevention (CDC) to establish public health preparedness and a response plan for bioterrorism. With funds from the CDC and an additional grant from the Health Resources and Services Administration (HRSA), the DPH designated Hartford Hospital as one of two Centers of Excellence that will coordinate and manage a statewide system for bioterrorism preparedness. This paper reviews the progress that Hartford Hospital has made in meeting this challenge. Highlighted are the development of a Web application to use for statewide preparedness and response, and the preparation for a smallpox vaccination program at Hartford Hospital.
PMID: 12664837 [PubMed - indexed for MEDLINE]

27: Crit Care Clin. 2003 Apr;19(2):279-313.
Bioterrorism and critical care.
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A bioterrorist attack of any kind has the potential to overwhelm a community and, indeed, in the case of smallpox, an entire nation. During such an attack the number of patients requiring hospitalization and specifically critical care is likely to be enormous. Intensivists will be at the forefront of this war and will play an important role in dealing with mass casualties in an attempt to heal the community. A high degree of suspicion and prompt recognition of an event will be required to contain it. Specific knowledge of the possible agents that can be used will be key in managing patients and in estimating the needs of a health care facility and community to deal with the future course of events. Intensivists play various roles aside from the delivery of critical care to the
patient in the ICU. These roles include making triage decisions regarding the appropriate use of critical care beds (which automatically dictates how other non-ICU beds are used and managed) and serving as a team member of ethics committees (on such issues as dying, futility, and withdrawal of care). Indeed, intensivists are no strangers to disaster management and have served on the forefront of many. A biologic weapons attack, however, is likely to push this multidimensional nature of the intensivist to the maximum, because such an attack is likely to result in a more homogeneous critically ill population where the number of critical care staff and supplies to treat the victims may be limited. One hopes that such an event will not occur. Sadly, however the events of September 11, 2001, have only heightened the awareness of such a possibility.
Publication Types: Review Review, Tutorial
PMID: 12699324 [PubMed - indexed for MEDLINE]

28: Curr Opin Investig Drugs. 2003 Feb;4(2):172-8.
Therapeutic options for diseases due to potential viral agents of bioterrorism.
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The etiologic agents of smallpox and viral hemorrhagic fever have emerged as potential agents of bioterrorism due to their virulence, potential for human to human dissemination and limited strategies for treatment and prevention. Cidofovir has shown significant promise in animal models, and limited case reports in humans are encouraging. Ribavirin is the treatment of choice for certain hemorrhagic fever viral infections, but has no current application to Ebola and Marburg infections. Current vaccine strategies for smallpox are effective, but carry significant risk for complications. Licensed vaccines for
hemorrhagic fever viruses are limited to yellow fever, but animal studies are promising. Genomic analysis of the viral pathogen and the animal model response to infection may provide valuable information enabling the development of novel treatment and prevention strategies. Current knowledge of these strategies is reviewed.
Publication Types: Review Review, Tutorial

PMID: 12669378 [PubMed - indexed for MEDLINE]

29: Curr Opin Pediatr. 2003 Feb;15(1):107-11.
Ring-a-ring-a-roses: bioterrorism and its peculiar relevance to pediatrics.
Cieslak TJ, Henretig FM.
San Antonio Military Pediatric Center, San Antonio, Texas, USA.
Ted.Cieslak@amedd.army.mil
Publication Types: Review Review, Tutorial
PMID: 12544281 [PubMed - indexed for MEDLINE]

30: Dev Biol (Basel). 2002;110:107-12.
Difficulties associated with the development and licensing of vaccines for protection against bio-warfare and bio-terrorism.
Langford MJ, Myers RC.
DynPort Vaccine Company, Vaccine Development, Fredrick, MD 21702, USA.
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Today there is an increasing need to license vaccines for the protection of individuals against bio-warfare and bio-terrorism. While the need is apparent, the actual road to developing, producing and licensing such vaccines successfully is as yet undefined. Bio-defence vaccine candidates may come from several sources. They may come from vaccines that were previously licensed but are no longer in production, vaccines that are currently in an IND status, vaccines currently licensed in foreign countries, and newer vaccines currently under development. The issues that apply to the development and licensing of these vaccines can be defined by currently accepted standards for manufacture, and the requirement to demonstrate safety and efficacy to a level that gives the scientific and medical community, regulatory agencies, users and the public at
large confidence. Requirements for manufacturing and demonstration of safety will be consistent with vaccines being developed for traditional purposes. However, demonstration of efficacy will be more difficult. Because field trials for these vaccines are generally not feasible and the conduct of human challenge studies is generally considered unethical, the demonstration of efficacy will need to be based on existing efficacy data, a thorough understanding of both the disease's pathogenesis and mechanism of protection, the ability to identify surrogate markers for efficacy, and the use of the proposed FDA "animal rule".
PMID: 12477313 [PubMed - indexed for MEDLINE]

31: Dev Biol (Basel). 2002;110:99-105.
Development of vaccines for bio-warfare agents.
Rosenthal SR, Clifford JC.
Division of Vaccines and Related Products Applications, Office of Vaccines Research and Review, CBER/FDA, Rockville, Maryland 20852, USA.
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There is a recognized need for the development of new vaccines (as well as other biologicals and drugs) to counteract the effects of a potential bio-terrorist or bio-warfare event in the U.S. domestic population and military forces. Regulation of products to protect against potential bio-warfare agents poses unique challenges since the usual measures of efficacy that require exposure to natural disease may not currently be possible, for epidemiological and ethical reasons. To help to address

this issue, the FDA has published and requested comments on a proposed animal rule intended to address certain efficacy issues for new agents for use against lethal or permanently disabling toxic substances. Recent product development activity has focused on Bacillus anthracis (anthrax) and variola major (smallpox), agents that are regarded as highest priority in posing a risk to national security. FDA resources exist to assist vaccine developers with regard to the novel challenges posed in the dinical development of these products.
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Vaccine development: the biological weapon imperative.
Robertson AG.
Joint Health Support Agency, Campbell Park, ACT, Australia. agrobert@excite.com

The biological warfare capabilities of state and non-state actors continue to grow worldwide, both in sophistication and breadth. More than a dozen nations, including Iraq, Iran, Libya, Syria and North Korea, are either actively pursuing or possess biological weapons for use against their enemies. There is also a heightened awareness of the use of such agents by terrorist groups, a possibly deleterious side-effect of an increased awareness by the general public. This paper looks at the growing threat of the use of biological agents by both national programmes and non-state actors, the possible agents which might be considered for use, and the potential role that vaccine development may have in protecting both military and civilian populations against biological weapons attacks in the future.
Publication Types: Review Review, Tutorial
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Diagnosis, management, and containment of smallpox infections.
Veenema TG.

Center for High-Risk Children and Youth, University of Rochester School of Nursing, 601 Elmwood Ave, Box SON, Rochester, NY 14642, USA.

The US public health system and primary health care providers must be prepared to address varied biologic agents, including pathogens that are rarely seen in the United States. The increased frequency of international travel, combined with the current national concerns regarding bioterrorism, create an imperative for health practitioners to be more knowledgeable about specific biologic agents. Smallpox poses a serious bioterrorist threat to the US population at this time. Thus, if an outbreak occurred, prompt recognition and the implementation of control measures would be important.
Publication Types: Review Review, Tutorial
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Counterterrorism planning using the Hazardous Substances Events Surveillance system.
Manassaram DM, Orr MF, Kaye WE.
Division of Health Studies/Epidemiology and Surveillance Branch, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia 30333, USA.
dmanassaram@cdc.gov

The Hazardous Substances Emergency Events Surveillance (HSEES) system was developed in 1990 and is maintained by the Agency for Toxic Substances and Disease Registry, a public health agency within the United States Department of Health and Human Services. HSEES data can be used for hazard vulnerability assessments. Baseline patterns of hazardous substance releases can be used by local emergency planning committees to (1) identify substances that cause serious injuries, (2) improve monitoring and control of access, and (3) assess the preparedness of responding agencies. HSEES is an active surveillance system that can be useful in the early detection of unusual occurrences involving hazardous substances.
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A postevent smallpox mass vaccination clinic exercise.
Andress K.
Emergency Service, CHRISTUS Schumpert Health System, Shreveport, Louisiana 71101, USA. knox_andress@shs

Emergency response plans require careful planning and testing. The exercises can be in the form of tabletop, functional, and full-scale activities. To test a regional plan, various agencies from Louisiana, Arkansas, and Texas conducted a postevent mass smallpox vaccination clinic that incorporated federal, state, and local resources. An evaluation of the exercise is provided along with the recommendations for improving a similar future exercise.
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Pediatric implications in bioterrorism: education for healthcare providers.
Bernardo LM, Kapsar P.
University of Pittsburgh School of Nursing, Pittsburgh, Pennsylvania 15261, USA.
PMID: 12704321 [PubMed - indexed for MEDLINE]

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Tularemia of the head and neck: a possible sign of bioterrorism.
Stupak HD, Scheuller MC, Schindler DN, Ellison DE.
Department of Otolaryngology-Head and Neck Surgery, University of California, 400 Parnassus Ave., Suite A717, San Francisco, CA 94143, USA.
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Recent bioterror attacks and other world events have focused the medical community's attention on agents that might be used in biological warfare. One of these potential biological weapons is Francisella tularensis, a gramnegative coccobacillus that is one of the most infectious bacteria known. F tularensis can cause severe, even fatal, systemic tularemia. Under normal circumstances, F tularensis is transmitted by infected ticks, insects, and other animals. As a weapon of

terrorism, the bacterium would likely be disseminated as an aerosol and contracted by inhalation. Because many cases of tularemia are characterized by head and neck symptoms, otolaryngologists should be familiar with the diagnosis and management of this disease. In this article, we describe a case of zoonotic tularemia that manifested as a neck mass, and we review the pathophysiology, diagnosis, and treatment of tularemia. We also summarize what is known about its potential as a biological weapon.
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Biotechnology to fight bioterrorism. While the fight against terrorism is helping to revitalize the biotech market, academic scientists are starting to worry about limitations on research.
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Advances in life sciences and bioterrorism.
Beck V.
Volker Beck is Advisor to the Federal Government Commissioner for Disarmament and Arms Control at the German Foreign Office in Berlin, Germany. beckvolker@aol.com
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Endemic, notifiable bioterrorism-related diseases, United States, 1992-1999.
Chang MH, Glynn MK, Groseclose SL.
Centers for Disease Control and Prevention, Atlanta, Georgia, USA. mdc9@cdc.gov

Little information is available in the United States regarding the incidence and distribution of diseases caused by critical microbiologic agents with the potential for use in acts of terrorism. We describe disease-specific, demographic, geographic, and seasonal distribution of selected bioterrorism-related conditions (anthrax, botulism, brucellosis, cholera, plague, tularemia, and viral encephalitides) reported to the National Notifiable Diseases Surveillance System in 1992 to 1999. Tularemia and brucellosis were the most frequently reported diseases. Anthrax, plague, western equine encephalitis, and eastern equine encephalitis were rare. Higher incidence rates for cholera and plague were noted in the western United States and for tularemia in the
central United States. Overall, the incidence of conditions caused by these critical agents in the United States is low. Individual case reports should be considered sentinel events. For potential bioterrorism-related conditions that are endemic and have low incidence, the use of nontraditional surveillance methods and complementary data sources may enhance our ability to rapidly detect changes in disease incidence.
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Community reaction to bioterrorism: prospective study of simulated outbreak.
DiGiovanni C Jr, Reynolds B, Harwell R, Stonecipher EB, Burkle FM Jr.

To assess community needs for public information during a bioterrorism-related crisis, we simulated an intentional Rift Valley fever outbreak in a community in the southern part of the United States. We videotaped a series of simulated print and television "news reports" over a fictional 9-day crisis period and invited various groups (e.g., first-responders and their spouses or partners, journalists) within the selected community to view the videotape and respond to questions about their reactions. All responses were given anonymously. First-responders and their spouses or partners varied in their reactions about how the crisis affected family harmony and job performance. Local journalists exhibited considerable personal fear and confusion. All groups demanded, and put more trust in, information from local sources. These findings may have implications for risk communication during bioterrorism-related outbreaks.
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Bioterrorism-related Inhalational Anthrax in an Elderly Woman, Connecticut, 2001.
Griffith KS, Mead P, Armstrong GL, Painter J, Kelley KA, Hoffmaster AR, Mayo D, Barden D, Ridzon R, Parashar U, Teshale EH, Williams J, Noviello S, Perz JF, Mast EE, Swerdlow DL, Hadler JL.
Centers for Disease Control and Prevention, Atlanta, Georgia, USA. kkg8@cdc.gov

On November 20, 2001, inhalational anthrax was confirmed in an elderly woman from rural Connecticut. To determine her exposure source, we conducted an extensive epidemiologic, environmental, and laboratory investigation. Molecular subtyping showed that her isolate was indistinguishable from isolates associated with intentionally contaminated letters. No samples from her home or community yielded Bacillus anthracis, and she received no first-class letters from facilities known to have processed intentionally contaminated letters. Environmental sampling in the regional Connecticut postal facility yielded B. anthracis spores from 4 (31%) of 13 sorting machines. One extensively contaminated machine primarily processes bulk mail. A second machine that does final sorting of bulk mail for her zip code yielded B. anthracis on the column of bins for her carrier route. The evidence suggests she was exposed through a cross-contaminated bulk mail letter. Such cross-contamination of letters and postal facilities has implications for managing the response to future B. anthracis-contaminated mailings.
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Isolated Case of Bioterrorism-related Inhalational Anthrax, New York City, 2001.
Holtz TH, Ackelsberg J, Kool JL, Rosselli R, Marfin A, Matte T, Beatrice ST, Heller MB, Hewett D, Moskin LC, Bunning ML, Layton M.
Centers for Disease Control and Prevention, Atlanta, Georgia, USA. tkh3@cdc.gov

On October 31, 2001, in New York City, a 61-year-old female hospital employee who had acquired inhalational anthrax died after a 6-day illness. To determine sources of exposure and identify additional persons at risk, the New York City Department of Health, Centers for Disease Control and Prevention, and law enforcement authorities conducted an extensive investigation, which included interviewing contacts, examining personal effects, summarizing patient's use of mass transit, conducting active case finding and surveillance near her residence and at her workplace, and collecting samples from co-workers and the environment. We cultured all specimens for Bacillus anthracis. We found no additional cases of cutaneous or inhalational

anthrax. The route of exposure remains unknown. All environmental samples were negative for B. anthracis. This first case of inhalational anthrax during the 2001 outbreak with no apparent direct link to contaminated mail emphasizes the need for close coordination between public health and law enforcement agencies during bioterrorism-related investigations.
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Fear of bioterrorism and implications for public health preparedness.
Dworkin MS, Ma X, Golash RG.
Illinois Department of Public Health, Chicago, Illinois 60601, USA.
mdworkin@idph.state.il.us

After the human anthrax cases and exposures in 2001, the Illinois Department of Public Health received an increasing number of environmental and human samples (1,496 environmental submissions, all negative for Bacillus anthracis). These data demonstrate increased volume of submissions to a public health laboratory resulting from fear of bioterrorism.
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McKnight Professor and HeadMicrobial Biochemistry and BiotechnologyDepartment of Biochemistry, MolecularBiology and BiophysicsUniversity of MinnesotaSt. Paul, MN 55108, USA.
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Addressing bioterrorism. What ethical issues and questions surround potential responses to bioterrorist attacks?
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Greene J.

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Infectious Diseases Department Austin and Repatriation Medical Centre, Department of Medicine University of Melbourne, Department of Epidemiology and Preventive Medicine Monash University and Chair, Bioterrorism Working Group Australasian Society for Infectious Diseases Melbourne, Victoria Australia.
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Department of Pathology, Division of Laboratory Medicine, University of Louisville School of Medicine and Hospital, Louisville, Kentucky 40202, USA. jwsnyd01@gwise.louisville.edu
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Public Health Laboratory Service, Communicable Disease Surveillance Centre, Cardiff, Wales, UK. brendan.mason@phls.wales.nhs.uk
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Olfactory functioning in Gulf War-era veterans: relationships to war-zone duty, self-reported hazards exposures, and psychological distress.
Vasterling JJ, Brailey K, Tomlin H, Rice J, Sutker PB.
Mental Health Service Line, Veterans Affairs Medical Center, New Orleans, Louisiana 70112, USA. jennifer.vasterling@med.va.gov

To explore possible neurotoxic sequelae of Gulf War (GW) participation, olfactory identification performance, neurocognitive functioning, health perceptions, and emotional distress were assessed in 72 veterans deployed to the GW and 33 military personnel activated during the GW but not deployed to the war zone. Findings revealed that war-zone-exposed veterans reported more concerns about health, cognitive functioning, and depression than did their counterparts who did not see war-zone duty. There was no evidence that performances on olfactory or neurocognitive measures were related to war-zone duty or to self-reported exposure to GW toxicants. However, symptoms of emotional distress were positively correlated with self-report of health and cognitive complaints. Results do not provide support for the hypothesis that objectively-measured
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Management issues surrounding the United Kingdom health services' ability to deal effectively with major incidents involving bioterrorism.
Hayward M.
Acute Medicine, Royal Hampshire County Hospital, Winchester, UK.
mrmrhayward@ntlworld.com

AIM: This paper aims to explore the management structures and issues surrounding the United Kingdom (UK) health services' preparedness and ability to effectively deal with major incidents involving bioterrorism. BACKGROUND: Recent reports and expert opinion have suggested that the health service response to terrorist incidents involving weapons of mass destruction are insufficient and ill-prepared. KEY ISSUES: Lack of clear guidance and parity across the UK, poor targeting of information, inadequate and insufficient equipment, under-resourcing, and unsatisfactory training are key factors that contribute to a worrying state of frontline unpreparedness. CONCLUSIONS: Health service managers need to capitalize on the Government's current concern about the threat of a bioterrorist attack and ensure that their departments are sufficiently equipped, and that their personnel are adequately educated and trained, to deal with any such incident. Better guidance needs to be produced and distributed to front line healthcare workers.
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Bioterrorism, embryonic stem cells, and Frankenstein.
Guinan P.
Department of Urology, University of Illinois-Chicago College of Medicine, USA.

The stem cell controversy raises a fundamental question for humankind. Does science have a right to pursue knowledge whatever the cost? Our Enlightenment culture says yes. However, human history and literature are sending warning signals.

Ethical issues impact the "knowledge for its own sake" imperative, and must be addressed.
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Don't suffer the consequences. Prepare your office for bioterrorism response.
Wolper LF, Gans DN, Peterson TP.
L. Wolper Inc., Great Neck, N.Y., USA. lwolperinc@mindspring.com

In a low-level bioterrorism attack without mass casualties, physician offices will stand at the front line for diagnosis and treatment. Lacking preparation, those offices can suffer some of the first casualties. Physicians and their administrators in ambulatory practices must be able to recognize and plan for a potential bioterrorism attack.
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Long-term health effects of exposure to sarin and other anticholinesterase chemical warfare agents.
Page WF.
Medical Follow-up Agency, Institute of Medicine, 500 Fifth Street, N.W., Washington, DC 20001, USA.

In a telephone survey of 4,022 military volunteers for a 1955-1975 program of experimental exposures to chemical agents at Edgewood, Maryland, the current health of those exposed to anticholinesterase agents was compared with that of men exposed to no active chemicals (no chemical test) and to two or more other types of chemical agents (other chemical tests). The survey posed questions about general health and about neurological and psychological deficits. There were only two statistically significant differences: volunteers in anticholinesterase agent tests reported fewer attention problems than those in other chemical tests and greater

sleep disturbance than those in no chemical tests. In contrast, volunteers who reported exposure to civilian or military
chemical agents outside of their participation in the Edgewood program reported many statistically significant adverse neurological and psychological effects, regardless of their experimental exposure. In this study, the health effects of self-reported, nonexperimental exposure, which are subject to recall bias, were greater than the health effects of experimental exposure.
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Recommendations for using smallpox vaccine in a pre-event vaccination program. Supplemental recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Healthcare Infection Control Practices Advisory Committee (HICPAC).
Wharton M, Strikas RA, Harpaz R, Rotz LD, Schwartz B, Casey CG, Pearson ML, Anderson LJ; Advisory Committee on Immunization Practices; Healthcare Infection Control Practices Advisory Committee.
Epidemiology and Surveillance Division, National Center for Infectious Diseases, USA.

This report supplements the 2001 statement by the Advisory Committee on Immunization Practices (ACIP) (CDC. Vaccinia [smallpox] vaccine: recommendations of the Advisory Committee on Immunization Practices [ACIP], 2001. MMWR 2001;50[No. RR-10]:1-25). This supplemental report provides recommendations for using smallpox vaccine in the pre-event vaccination program in the United States. To facilitate preparedness and response, smallpox vaccination is recommended for persons designated by public health authorities to conduct investigation and follow-up of initial smallpox cases that might necessitate direct patient contact. ACIP recommends that each state and territory establish and maintain > or = 1 smallpox response team. ACIP and the Healthcare Infection Control Practices Advisory Committee (HICPAC) recommend that each acute-care hospital identify health-care workers who can be vaccinated and trained to provide direct medical care for the first smallpox patients requiring hospital admission and to evaluate and manage patients who are suspected as having smallpox. When feasible, the first-stage vaccination program should include
previously vaccinated health-care personnel to decrease the potential for adverse events. Additionally persons administering smallpox vaccine in this pre-event vaccination program should be vaccinated. Smallpox vaccine is administered by using the multiple-puncture technique with a bifurcated needle, packaged with the vaccine and diluent. According to the product labeling, 2-3 punctures are recommended for primary vaccination and 15 punctures for revaccination. A trace of blood should appear at the vaccination site after 15-20 seconds; if no trace of blood is visible, an additional 3 insertions should be made by using the same bifurcated needle without reinserting the
needle into the vaccine vial. If no evidence of vaccine take is apparent after 7 days, the person can be vaccinated again. Optimal infection-control practices and appropriate site care should prevent transmission of vaccinia virus from vaccinated health-care workers to patients. Health-care personnel providing direct patient care should keep their vaccination sites covered with gauze in combination with a semipermeable membrane dressing to absorb exudates and to provide a barrier for containment of vaccinia virus to minimize the risk of transmission; the dressing should also be covered by a layer of clothing. Dressings used to cover the site should be changed frequently to prevent

accumulation of exudates and consequent maceration. The most critical measure in preventing contact transmission is consistent hand hygiene. Hospitals should designate staff to assess dressings for all vaccinated health-care workers. When feasible, staff responsible for dressing changes for smallpox health-care teams should be vaccinated, all persons handling dressings should observe contact precautions. Administrative leave is not required routinely for newly vaccinated health-care personnel unless they are physically unable to work as a result of systemic signs and symptoms of illness; have extensive skin lesions that cannot be adequately covered or if they are unable to adhere to the recommended infection-control precautions. Persons outside the patient-care setting can keep their vaccination sites covered with a porous dressing hand hygiene remains key to preventing inadvertent inoculation. FDA has recommended that recipients of smallpox vaccine be deferred from donating blood for 21 days or until the scab has separated. Contacts of vaccinees, who have inadvertently contracted vaccinia, also should be deferred from donating blood for 14 days after complete resolution of their complication. In the pre-event vaccination program, smallpox vaccination is contraindicated for persons with a history or presence of eczema or atopic dermatitis; who have other acute, chronic, or exfoliative skin conditions; who have conditions associated with immunosuppression; are aged < 1 year; who have a serious allergy to any component of the vaccine; or who are pregnant or breastfeeding. ACIP does not recommend smallpox vaccination for children and adolescents aged < 18 years during the pre-event vaccination program. Pre-event vaccination also is contraindicated among persons with household contacts who have a history or presence of eczema or atopic dermatitis; who have other acute, chronic, or exfoliative skin conditions; who have conditions associated with immunosuppression; or who are pregnant. For purposes of screening for contraindications for pre-event vaccination, household contacts include persons with prolonged intimate contact (e.g., sexual contacts) with the potential vaccinee and others who migh
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Terriff CM, Schwartz MD, Lomaestro BM; Society of Infectious Diseases Pharmacists.
Washington State University College of Pharmacy and Deaconess Medical Center, Spokane, Washington, USA.

OBJECTIVES: To discuss specific facts regarding use as a bioweapon, epidemiology, microbiology, clinical manifestations, diagnosis, antimicrobial therapy, immunization, and isolation precautions for five most likely agents of bioterrorism; to review and provide recommendations for health care clinicians on the management of these bioterrorism agents; and to share information on the pharmacist's role in preparedness and response. PARTICIPANTS: The manuscript was drafted by the three authors, reviewed by a group of selected members of the Society of Infectious Diseases Pharmacists, and approved by its Board of Directors. EVIDENCE: The primary focus was to review and summarize recent and key articles on bioterrorism. Preference was given to peer-reviewed journal
information and government-sponsored journals, such as the MMWR, Morbidity and Mortality Weekly Report. CONSENSUS PROCESS: Written comments were requested from each reviewer. Comments were incorporated into the final draft. CONCLUSION: Pharmacists play an integral role in disaster preparedness and response and should be involved in planning committees. As drug information specialists, pharmacists can assist other health care providers and emergency personnel, as well as provide counseling to calm, comfort, and empower the public.
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Bioterrorism is an area of increasing public health concern. The intent of this article is to review the air cleansing technologies available to protect building occupants from the intentional release of bioterror agents into congregate spaces (such as offices, schools, auditoriums, and transportation centers), as well as through outside air intakes and by way of recirculation air ducts. Current available technologies include increased ventilation, filtration, and ultraviolet germicidal irradiation (UVGI) UVGI is a common tool in laboratories and health care facilities, but is not familiar to the public, or
to some heating, ventilation, and air conditioning engineers. Interest in UVGI is increasing as concern about a possible malicious release of bioterror agents

mounts. Recent applications of UVGI have focused on control of tuberculosis transmission, but a wide range of airborne respiratory pathogens are susceptible to deactivation by UVGI. In this article, the authors provide an overview of air disinfection technologies, and an in-depth analysis of UVGI-its history, applications, and effectiveness.
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Public health investigators have successfully carried out epidemiologic investigations of outbreaks of disease for many years. By far the majority of these outbreaks have occurred naturally. With the recent illnesses resulting from deliberate dissemination of B. anthracis on an unsuspecting population, public health investigation of diseases must now include consideration of bioterrorism as a potential cause of outbreaks of disease. The features of naturally occurring outbreaks have a certain amount of predictability in terms of consistency with previous occurrences, or at least biological plausibility.
However, with a deliberately introduced outbreak or infection among a population, this predictability is minimized. In this paper, the authors propose some epidemiologic clues that highlight features of outbreaks that may be suggestive of bioterrorism. They also describe briefly the general process of involvement of agencies at various levels of government, public health and non-public health, depending on the extent of an outbreak or level of suspicion.
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Bioterrorism and Electron Microscopic Differentiation of Poxviruses from Herpesviruses: Dos and Don'ts.

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With increased threat of terrorism, much attention is being directed toward readiness for biodefense. Smallpox virus, a deadly and much feared organism, is among possible bioterrorism agents. Herpesviruses, such as the one that causes chickenpox and shingles, produce skin lesions that may resemble those seen early in smallpox infection. Electron microscopy (EM) is a rapid and reliable method for differentiating poxviruses from herpesviruses. However, before becoming involved in the monitoring of potential smallpox cases, a laboratory must consider several issues, including expertise in virus identification, capacity for handling biohazards, and health and immune status of laboratory staff.

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